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Statement of Work

Appendix to Administrative Settlement Agreement and Order on Consent for Removal Action

Offsite Operable Unit
Triple Site Superfund Site
Sunnyvale, California

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I. Introduction

This Statement of Work (SOW) is incorporated into the Administrative Settlement Agreement and Order on Consent for Removal Action (Settlement) at the Offsite Operable Unit (OOU or the Site), an OU of the Triple Site Superfund Site, in Sunnyvale, California.

This SOW describes the Work required to complete a vapor intrusion (VI) Removal Action consisting of an evaluation of VI to indoor air and implementation of mitigation measures.

Respondent, Philips, has conducted significant portions of the Work described in this SOW in the OOU pursuant to the now-terminated 2015 Settlement. This SOW provides for a continuation of work begun under the previous Settlement and its associated Work Plan. Respondents shall resume the previously-initiated VI assessment and mitigation activities following the Effective Date of the Settlement and in accordance with this SOW. This SOW also builds upon that work and includes new requirements for the development and implementation of a plan for preemptive mitigation of structures in the highest-risk area of the OOU (approximately 40 buildings located on East Duane Avenue's 700 block, San Jule Court, San Justo Court, San Luisito Way, San Miguel Avenue's odd-numbered side of the 600 block, and Carmel Avenue, excluding the newer, slab-on-grade condominiums) and a plan for identifying a groundwater-based line of evidence to trigger preemptive mitigation.

II. General Requirements

A. Technical Meetings

Upon EPA's request, Respondents shall participate in and present at periodic technical meetings to discuss planning and implementation of the Removal Action. In addition to discussion of the technical aspects of the Work, topics shall include anticipated problems or new issues.

B. Community Involvement

Community involvement will be conducted in accordance with EPA guidance and the NCP.

If requested by EPA, Respondents shall participate in community involvement activities, including participation in:

1) the preparation of information regarding the Work for dissemination to the public, with consideration given to mass media and/or Internet notification;

2) the preparation and implementation of building-specific communications plans to ensure building owners and occupants are adequately informed of and have an opportunity to discuss planned sampling activities, sampling results, and risk management measures; and

2) public meetings that may be held or sponsored by EPA to explain activities at or

relating to the Site.

Respondents' support of EPA's community involvement activities may include providing online access to initial submissions and updates of deliverables to:

1) any Community Advisory Groups;

2) any Technical Assistance Grant recipients and their advisors, where such grants have been awarded; and

3) other entities to provide them with a reasonable opportunity for review and comment.

EPA may describe in its community involvement materials Respondents' responsibilities for community involvement activities. All community involvement activities conducted by Respondents at EPA's request are subject to EPA's oversight. Upon EPA's request, Respondents shall make all deliverables available on a website that is accessible to the public. Upon EPA's request, Respondents shall establish a community information repository at or near the Site to house one copy of the administrative record.

If requested by EPA, Respondents shall designate and notify EPA of Respondents' Community Involvement Coordinator (CI Coordinator), if different from the Project Coordinator. Respondents may hire a contractor for this purpose. Respondents' notice must include the name, title, and qualifications of the Respondents' CI Coordinator. Respondents' CI Coordinator is responsible for providing support regarding EPA's community involvement activities, including coordinating with EPA's CI Coordinator regarding responses to the public's inquiries about the Site.

C. Off-Site Shipments

Respondents may ship hazardous substances, pollutants, and contaminants from the Site to an off-Site facility only if Respondents comply with Section 121(d)(3) of CERCLA, 42 U.S.C. § 9621(d)(3), and 40 C.F.R. § 300.440. Respondents will be deemed to be in compliance with Section 121(d)(3) of CERCLA, 42 U.S.C. § 9621(d)(3), and 40 C.F.R. § 300.440 regarding a shipment if Respondents obtain a prior determination from EPA that the proposed receiving facility for such shipment is acceptable under the criteria of 40 C.F.R. § 300.440(b).

Respondents may ship waste material from the Site to an off-Site waste management facility only if, prior to any shipment, they provide written notice to the appropriate state environmental official in the receiving facility's state and to EPA's Project Coordinator. This notice requirement shall not apply to any off-Site shipments when the total quantity of all such shipments will not exceed ten cubic yards.

The written notice must include the following information, if available: (1) the name and location of the receiving facility; (2) the type and quantity of Waste Material to be shipped; (3) the schedule for the shipment; and (4) the method of transportation. Respondents shall also

notify the state environmental official referenced above and EPA's Project Coordinator of any major changes in the shipment plan, such as a decision to ship the Waste Material to a different out-of-state facility. Respondents shall provide the written notice after the award of the contract for the Work and before the waste material is shipped.

Respondents may ship Investigation Derived Waste (IDW) from the Site to an off-Site facility only if it complies with Section 121(d)(3) of CERCLA, 42 U.S.C. § 9621(d)(3), 40 C.F.R. § 300.440, EPA's "Guide to Management of Investigation Derived Waste," OSWER 9345.3-03FS (Jan. 1992), and any IDW-specific requirements contained in the SOW. Wastes shipped off-Site to a laboratory for characterization, and Resource Conservation and Recovery Act (RCRA) hazardous wastes that meet the requirements for an exemption from RCRA under 40 C.F.R. § 261.4(e) shipped off-Site for treatability studies, are not subject to 40 C.F.R. § 300.440.

D. Certifications

Deliverables submitted to EPA pursuant to the SOW shall include the following certification signed by a responsible corporate official of Respondents or Respondents' Project Coordinator:

> "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

III. Removal Action Deliverables

A. Indoor Air Sampling and Analysis Removal Work Plan (Updated Removal Work Plan)

Respondents shall prepare and submit to EPA for approval an updated Indoor Air/VI Sampling and Analysis Removal Work Plan (Updated Removal Work Plan). The Updated Removal Work Plan shall cover all buildings in the Offsite OU, including residential and school buildings, and shall include the items listed in (1) through (8), below.

Respondent, Philips, previously submitted, and EPA approved, a document entitled, *Work Plan, Additional Vapor Intrusion Evaluation, The Companies Offsite Operable Unit, Sunnyvale, California, January 7, 2015* (VI Work Plan), followed by a document entitled, *Work Plan Addendum, Addendum 1 to Additional Vapor Intrusion Evaluation Work Plan: Supplemental Indoor Air Investigation to Address Spatial Data Gaps at Three Facilities, January 8, 2018* (School VI Addendum). Generally, many of the requirements for the Updated Removal Work Plan are already addressed in the VI Work Plan and School VI Addendum and may be resubmitted as currently approved by EPA in the Updated Removal Work Plan. The following

sections are new Work areas that shall also be addressed in the Updated Removal Work Plan: (1) Section III(A)(4) on preemptive mitigation; (2) Section III(A)(5) on updating the Conceptual Site Model (CSM) and establishing a groundwater TCE-based line-of-evidence for preemptive mitigation; (3) Section III(A)(7)(j) on a minimum level of longer-term sampling; (4) Section III(D) on building-specific reports; and (5) Section III(E)(5) on post-removal site controls (PRSC).

1) ***The Updated Removal Work Plan shall include procedures for Progress Reports, including:***

   a) Submitting written monthly progress reports to EPA by the tenth (10^{th}) day of the following month;

   b) Describing the actions that have been taken to comply with the SOW and the Settlement;

   c) Describing all significant developments since submittal of the last Progress Report;

   d) Including all results of sampling and tests and all other data obtained or generated by or on behalf of Respondents with respect to the Site and/or the Work;

   e) Describing the activities planned for the next two (2) months and associated schedules; and

   f) Describing all problems encountered in complying with the requirements of the Settlement and any anticipated problems, any actual or anticipated delays, and solutions developed and implemented to address any actual or anticipated problems or delays.

2) ***The Updated Removal Work Plan shall include procedures for scoping, including:***

   a) Coordinating with EPA to define the specific objectives of the Removal Action and plan the Removal Action scope;

   b) Documentation of the Removal Action objectives and overall project scope in the Removal Work Plan; and

   c) Meeting with EPA to discuss key project planning decisions and special concerns associated with the Offsite OU (Scoping Meeting).

3) ***The Updated Removal Work Plan shall include procedures for development of a Health and Safety Plan (HASP), in accordance with the schedule set forth in this SOW.***

Respondents shall submit for EPA review and comment a plan that ensures the protection of the public health and safety during performance of on-site work under the Settlement. This plan shall be prepared in accordance with applicable guidance documents. The plan shall also include confined space planning for building-specific response actions. Respondents shall incorporate all changes to the plan recommended by EPA and shall implement the plan during the implementation of the Removal Action. This plan shall be prepared in accordance with "OSWER Integrated Health and Safety Program Operating Practices for OSWER Field Activities," Pub. 9285.0-OlC (Nov. 2002), available on the NSCEP database at [HYPERLINK "https://www.epa.gov/nscep"], and "EPA's Emergency Responder Health and Safety Manual," OSWER Directive 9285.3-12 (July 2005 and updates), available at [HYPERLINK "https://www.epaosc.org/_HealthSafetyManual/manual-index.htm"]. In addition, the plan shall comply with all currently applicable Occupational Safety and Health Administration (OSHA) regulations found at 29 C.F.R. Part 1910.

4) ***The Updated Removal Work Plan shall include procedures for implementation of preemptive mitigation measures for structures in the highest-risk area of the OOU to address unacceptable TCE vapor intrusion to indoor air, including:***

a) Making offers of preemptive mitigation to property owners of buildings on the following streets (approximately 40 structures):

1. East Duane Avenue (700 block odd);
2. San Jule Court;
3. San Justo Court;
4. San Luisito Way;
5. San Miguel Avenue (600 block odd); and
6. Carmel Avenue (excluding newer slab-on-grade condominiums).

b) Development of a community relations approach, per Section II(B), above, and including:

1. Development of a generic template for an offer of preemptive mitigation to property owners and tenants;
2. Plans for meetings with owners, occupants, and other stakeholders; and
3. Execution of written access forms for mitigation system installation and maintenance.

c) Development of building-specific preemptive mitigation plans where offers of preemptive mitigation are accepted; and

d) Development of a plan for PRSC (see below) at all buildings where preemptive mitigation systems are installed or other preemptive measures are taken.

5) For areas of the OOU other than the highest-risk area described in Section III(A)(4)(a), above, the Updated Removal Work Plan shall include procedures for preparing and submitting to EPA for approval an updated CSM Technical Memorandum (TM), identifying data needs via Data Gap Evaluations, establishing Data Quality Objectives (DQOs) for data collected, and conducting an initial data evaluation. Respondent, Philips, previously submitted, and EPA approved, a CSM as Section 3 of the Work Plan submitted pursuant to the 2015 AOC. The following sections are new Work areas that shall also be addressed in the updated CSM TM, or otherwise comments that were previously provided to Respondent, Philips, for their consideration on the CSM which require additional submittals:

a) Collection of all available and pertinent information to update the CSM TM for the Site to include the VI pathway and pollutant distribution in indoor and pathway air as well as discussions of Site-related contaminant contributions to outdoor air;

b) Modification of the statement in the previous Work Plan, Section 3.1.2, CSM, Secondary Sources: "…there are not residential VOCs [Volatile Organic Compounds] entrained within or sorbed to soil as secondary sources at the site…" In general, CSMs should avoid absolute statements of this magnitude. Specifically, it is probable that some measurable concentrations of VOCs are present in former source areas, separate from groundwater contamination, and it is possible that there are residual VOCs sorbed to soils in areas where groundwater concentrations have decreased. The CSM should state that these secondary sources are not expected to be significant and the CSM for VI is volatilization from the current groundwater contaminant plume;

c) Supplementation to the statement in the previous Work Plan, Section 3.2.1.1, CSM, Site Characterization, Soil. This section states that VOCs were not detected in soil, however, there is no information on when and where previous soil investigations occurred. This information should be added to the Updated Removal Work Plan. Additionally, the site characterization discussion in the Updated Removal Work Plan should address the potentially low bias of soil samples from sample collection and handling techniques;

d) Supplementation to the previous Work Plan, Section 3.2.1.3.1, CSM, Site Characterization, Description of the Groundwater Monitoring Program. This section discusses water elevation measurements and notes that "contours can be generated." However, no contours are provided in the plan. Because the depth to groundwater has a significant impact on susceptibility to VI, aquifer- and

contaminant-specific groundwater contour maps should be added to the Updated Removal Work Plan;

e) Submittal for EPA approval Data Gap Evaluations to evaluate and identify data needs (see also Section III(6)(i) below), including consideration of, but not limited to, sampling or survey data previously collected at and near buildings during previous OOU indoor air investigation and mitigation response actions through the present, including groundwater, soil, soil vapor, sub-slab soil vapor, indoor air, pathway air, and outdoor air; mitigation system information (where such are present); water level contours; subsurface properties; municipal sewer line information; and data generated during environmental investigation activities at the TRW Microwave Site, AMD 901-902 Thompson Place Site, and Signetics Site;

f) Development of a groundwater TCE-based line of evidence, based on modeling and an evaluation of empirical, site-specific data, which would trigger preemptive mitigation in areas of the OOU other than the highest-risk area;

g) Submittal for EPA approval DQOs that address all of the various types of data that may be collected during the Removal Action, including chemical (analytical) data and physical data such as, but not limited to, building-specific data, groundwater level measurements, groundwater, indoor air, outdoor air and soil vapor data, lithologic data, borehole geophysical survey data, aquifer test data, and geodetic survey data, as appropriate, for sample locations.

h) Description of other previous and ongoing responses conducted at the OOU; and

i) Development of strategies for sampling and analysis if additional data needs are identified, as well as establishment of DQOs for collection of necessary additional data.

6) The Updated Removal Work Plan shall include procedures for implementation of building surveys at each building, including:

a) Identification of all building features, including physical features such as foundation type (e.g., basement, slab-on-grade, crawlspace or earthen floor), foundation condition, building size, ceiling heights, building use zones (e.g., school, residential) and building age, to determine whether there are building features that could influence VI;

b) Determination of the nature of building occupancy in a Building Occupancy Summary, or its equivalent, including general building use (e.g., daycare, school, residential), number of occupants (e.g., number of students, residents, employees, visitors), and days/hours of occupancy by all occupants;

c) Identification of any subsurface structures (e.g., elevator shafts, utility

conduits/tunnels, sewer lines, vaults, tanks, and sumps);

d) Identification of potential preferential pathways for soil vapor to enter indoor air (e.g., areas/rooms where utilities penetrate a slab foundation, piping and utility corridors, foundation gaps, construction joints and floor drains, dry water traps or deteriorated wax seals in toilets);

e) Assessments of building ventilation in a Ventilation Assessment Report, including:

1. Evaluation of passive ventilation, including windows, doors, and any large openings that are periodically used (such as roll-up doors);

2. Identification of areas that are not ventilated where vapors may enter the building and accumulate; and

3. Evaluation of the heating, ventilation and air conditioning (HVAC) system(s) and general operation, including number of distinct ventilation zones, ventilation cycles (daily, weekly, and seasonally), make-up air, and temperature settings;

f) Conducting a Chemical Inventory of VOC containing products inside the building, as appropriate, with a specific focus on products containing the site contaminants of concern (COCs);

g) Development of sampling strategies if products containing site COCs are identified, including communications with building owners and occupants to identify and remove confounding indoor sources of site COCs, as appropriate, and plans for managing indoor sources to avoid sample interference;

h) Evaluation of the specific chemical usage activities that take place within the building, as appropriate, and description of them in a Building Activities Summary Report or its equivalent, in order to target sampling locations away from the chemical usage areas because indoor air emissions in these areas could obscure VI pathways and/or interfere with analytical data;

i) Identification and evaluation of data gaps; and

j) Identification and implementation of VI evaluation protocols (see the following section) to address identified data gaps.

7) ***The Updated Removal Work Plan shall include an updated Sampling and Analysis Plan (SAP), including a Field Sampling Plan and Quality Assurance Project Plan for indoor air sample collection, in accordance with EPA guidance. Respondent, Philips, previously submitted, and EPA approved, a SAP pursuant to the 2015 AOC, however, the following Work areas also shall be addressed in the updated SAP:***

a) Additional procedures to ensure that staff implementing the SAP are familiar with the Updated Removal Work Plan, updated SAP and associated procedures, with additional job training and evaluation conducted for field staff;

b) Confirmation that document retention and archival times conform with Superfund record retention schedules; and

c) Submittal to EPA of Building-Specific Sampling Plan Addenda (see Section B, below), which must include:

1. Appropriate indoor air sampling locations targeting areas/rooms with potential preferential pathways; breathing zone sampling locations in areas generally representative of typical exposure; pathway air sampling locations (such as crawlspaces and basements), sub-slab air sampling locations, exterior soil vapor sampling locations; and ambient outdoor air sampling locations to represent the potential contribution of outdoor contaminants to indoor air concentrations;

2. Methodology (such as passive longer-term samples, grab samples, real-time field screening), DQOs and indicators;

3. Duration of sample collection (e.g., grab, 8-hour, 24-hour, days to weeks), conditions for sampling (e.g., ventilation when sampling occupied or unoccupied buildings), equipment to be used in sampling (e.g., evacuated canisters, passive absorption devices) as appropriate to the VI potential of concern;

4. Sampling rounds with and without ventilation operating (e.g., both the ventilation and cooling functions of the HVAC off, or with manual outdoor air intakes open and closed) at buildings with significant ventilation (including HVAC systems);

5. HVAC-off sampling with a sampling duration of a minimum of 36 hours, following shut-down of the building ventilation systems (no outdoor air intakes into the building) and continuing while HVAC systems remain off;

6. Providing adequate notice to building management/facilities departments and occupants about the testing schedule and timeframe for ventilation system shut-down given the greater potential for elevated indoor air contaminant concentrations while building ventilation is turned off;

7. Removal of potential indoor sources of site COCs that could interfere with analysis at least 24 hours prior to collection indoor air samples;

8. Surveying each building on the day of sampling to identify current conditions, including the ventilation system status (if present), occupancy, chemical presences and usage, and any other conditions that may impact the representativeness of the samples; and

9. Multiple indoor air sampling events, including during the winter heating season (generally November through February in the Bay Area) for residential-type buildings, targeting temperatures lower than 55 degrees Fahrenheit (F) as provided in the previous Work Plan, including at least one longer-term sampling event during the winter heating season and at least one longer-term sampling event for post-mitigation effectiveness monitoring to:

   i. Address the concern that where seasonal variation has been observed, the potential for VI is generally higher during colder periods of the year in winter when indoor temperatures are at least 10-15 degrees F higher than outdoor temperatures; and

   ii. Assist in assessing the variability in ambient outdoor air TCE concentrations during indoor air sampling periods and evaluate outdoor air TCE contributions to indoor air TCE levels detected.

8) The Updated Removal Work Plan shall present and discuss what mitigation measures and other response activities will be implemented to address unacceptable TCE vapor intrusion into indoor air, including:

a) Increasing outdoor air infiltration and instituting positive pressure ventilation;

b) Treating indoor air (for example, with carbon filtration or indoor air purifiers);

c) Investigating and sealing potential preferential pathways and conduits where vapors may be entering the building;

d) Installing passive vapor barriers and venting systems;

e) Installing, operating and maintaining sub-slab or sub-membrane depressurization systems (similar to radon mitigation systems);

f) Installing, operating and maintaining soil vapor extraction systems;

g) Temporarily relocating occupants, if necessary;

h) Conducting confirmatory sampling, including frequent monitoring and confirmatory sampling to verify effectiveness of ventilation-based mitigation measures;

i) Repairing response-related damages; and

j) Developing and submitting to EPA for approval plans for PRSC, including Operation and Monitoring (O&M) plans, which provide for more frequent monitoring of ventilation-based mitigation measures than annual monitoring, deed notices, recording packages, tracking of property owners and ownership turnover, or other types of institutional controls.

B. Building-Specific Sampling Plan Addenda

For each building sampled, Respondents shall prepare and submit to EPA for approval a Building-Specific Sampling Plan Addendum that includes, as appropriate: the Building Occupancy Summary (see Section III(A)(6)(b)), Ventilation Assessment (see Section III(A)(6)(e)), Chemical Inventory (see Section III(A)(6)(f)), Building Activities Summary (see Section III(A)(6)(h)), and specifying specific sampling locations based upon the previously conducted building surveys and short-term and long-term response action levels and response timeframes. The Building-Specific Sampling Plan Addendum shall also draw upon all available and pertinent information to present a building-specific CSM (see Section III(A)(5) above). To reduce the number of visits to a given building and the overall level of intrusiveness and maintain good relations with occupants, on a case-by-case basis, Respondent may request approval from EPA to conduct the building survey and sampling all in one visit and submit the Building-Specific Sampling Plan Addendum to EPA following the sampling event.

C. Indoor Air Sample Collection

Upon approval of each Building-Specific Sampling Plan Addendum, or as otherwise approved by EPA, Respondents shall commence indoor sample collection activities at the specific building in accordance with the approved Updated Removal Work Plan and Building-Specific Sampling Plan Addendum.

D. Implementation of Risk Management Activities

Based on the results of building specific sampling and as required by EPA, Respondents shall implement building- and area-specific Risk Management Activities. Risk Management Activities may include:

1) Prompt implementation (within weeks to months) of mitigation activities, including preemptive or precautionary mitigation, in the event of:

a. a building located within the highest-risk area of the OOU (see section III(A)(4)(a), above);

b. exceedances of the previously established groundwater TCE-based line of evidence which triggers preemptive mitigation (see section III(A)(4)(e), above); or

c. finding a VI occurrence of TCE within the Superfund Health Protective Cancer Risk Range[1] posing a long-term health threat of 0.4 – 2 micrograms per cubic meter ($\mu g/m^3$) for residential exposures and 3 – 9 $\mu g/m^3$ for 8-hour/day commercial/industrial exposures;[2]

2) Immediate implementation (within days to weeks) of interim mitigation activities in the event of finding a VI occurrence of TCE posing a potential short-term health threat (evidenced by the measurement of indoor air concentrations above a Hazard Quotient [HQ] of 1 or 9 $\mu g/m^3$ for an 8-hour commercial workday, 7 $\mu g/m^3$ for a 10-hour commercial workday, or 2 $\mu g/m^3$ for a residence or classroom) while long-term remedial options are considered, with the effectiveness of mitigation measures (defined as a reduction of the TCE indoor air concentrations to below the HQ=1 level) confirmed promptly, or within a few weeks; and

3) Immediate implementation (within days) of mitigation activities in the event of finding a VI occurrence of TCE posing a potential short-term health threat above an HQ of 3 (27 $\mu g/m^3$ for an 8-hour commercial workday, 21 $\mu g/m^3$ for a 10-hour commercial workday or 6 $\mu g/m^3$ for a residence or classroom) while long-term remedial options are considered, with the effectiveness of mitigation measures confirmed within a few days of installation.

E. Reports on Building-Specific Evaluation of Indoor Air and Mitigation Measures

For each building where VI sampling or other assessment activities were conducted, or where Risk Management Activities were implemented or planned, Respondents shall prepare and submit to EPA for approval, a Report on Building-Specific Evaluation of Indoor Air and Mitigation Measures. This report shall be submitted to EPA following Respondents' request on a building-specific basis and receipt of EPA's approval of completion of each Building-Specific Indoor Air Sample Collection Effort or completion of immediate or interim mitigation measures. The report shall include an evaluation of the data collected for that building, description of any immediate or interim mitigation measures conducted, recommendation of next steps, including any additional mitigation measures or preemptive mitigation measures, descriptions of plans for monitoring and verification of performance of mitigation measures, and plans for PRSC. EPA plans to transmit these reports to each property owner, together with a letter communicating sampling results, mitigation measures already taken and any necessary next steps. The report shall include the following:

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1 For cancer causing chemicals, the Superfund Health Protective Risk Range encompasses the range of concentrations EPA considers to be protective, from 1 to 100 in a million increased lifetime cancer risk. The level that falls into the most protective end of the risk range – 1 in a million increased lifetime risk – is what is used as the screening level for any particular chemical. After identifying the health protective levels, EPA then compares measured values to the lowest, most health-protective, end of the range. Although levels of exposure anywhere within the range may be acceptable, EPA's goal for indoor air exposures to Superfund site-related chemicals is to keep exposures as low as reasonably possible within the Superfund Health Protective Risk Range.

2 U.S. EPA Region 9 November 2017 Regional Screening Levels: [HYPERLINK "http://www.epa.gov/region9/superfund/prg"] Accessed June 2018.

1) Evaluation of data within the context of the multiple-lines-of-evidence approach, taking into consideration contaminant concentrations in outdoor air, indoor air, below occupied areas (including crawlspace air, basement air and pathway air), in subsurface soil vapor (including any evidence of a concentration gradient), and groundwater;

2) Data validation to ensure acceptable quality of the data, defensibility of the data, and verification that chain-of-custody requirements have been met;

3) Review of data for usability for its intended purpose, and preparation of a report of data validation and usability to EPA (or as a component of the Report on Evaluation of Indoor Air);

4) Comparison of measured indoor air contaminant concentration sampling results to long-term and, where appropriate, short-term health-based screening levels;

5) Comparison of groundwater TCE levels near buildings in the OOU to the groundwater-based TCE line of evidence for preemptive mitigation;

6) Screening site COCs, other than TCE short-term impacts, based on EPA's RSLs and/or screening levels developed using EPA's on-line RSL Calculator (see: [HYPERLINK "http://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search"]);

7) Consideration of possible contribution from potential indoor sources (e.g., consumer products, disinfection byproducts off-gassing from tapwater) and outdoor sources;

8) Evaluation of indoor air data in consideration of local, regional and historical ambient outdoor air data;

9) Evaluation of data in light of the information gathered regarding the specific building in which it was obtained;

10) Where data evaluation indicates that VI is occurring in a particular building, determination of planned mitigation measures based on the levels found and corresponding risks to health, the building occupant(s), and other building particulars;

11) Where indoor air levels indicate VI occurring below levels of health concern, consideration, development and implementation of building and/or procedural alterations, monitoring plans, institutional controls, and/or preemptive mitigation, as appropriate;

12) Where indoor air levels indicate VI occurring above short-term or long-term levels of health concern, evaluation of building conditions and occupancy to determine mitigation measures and timeframes;

13) Development and implementation of mitigation measures;

14) Building-specific communications plan to ensure building owners and occupants are adequately informed of sampling results and planned risk management measures; and

15) Plans for PRSCs.

Upon approval of the report by EPA, Respondents shall commence implementation of the Building-Specific Mitigation Measures in accordance with the approved schedules.

F. Building-Specific Mitigation Completion Reports

For each building where Risk Management Measures were implemented, Respondents shall prepare and submit to EPA for approval a Building-Specific Mitigation Completion Report. Respondent, Philips, previously submitted, and EPA approved, Building-Specific Mitigation Completion Reports (under the title of Operations and Maintenance or O&M plans) for certain buildings. In addition to the required City building/safety permits, Occupant Information Sheets, and as-built drawings already included in Respondent Philips' O&M plans, the following are new Work areas that must be addressed in future Building-Specific Mitigation Completion Reports. Previously submitted Building-Specific Mitigation Completion Reports shall be revised and re-submitted to EPA for approval, addressing these new Work areas:

1) O&M Plans for mitigation systems, including plans for post-mitigation indoor, outdoor and pathway air sampling and maintenance of mitigation systems, including at least one longer-term post-mitigation sampling event during the winter heating season;

2) Frequency of inspections of ventilation-based mitigation measures increased from annually; and

3) PRSCs, such as:

   1. Recorded agreements to help provide notice to current and future owners and occupants, EPA and Respondents when there is a change in building ownership or configuration;

   2. Recorded agreements, providing EPA and Respondents with the necessary access to maintain, operate, and remove, when appropriate, the VI remedy;

   3. A tracking service to provide notice to EPA and Respondents when changes are made to properties in the OOU; and

   4. A mapping database to help ensure that parties interested in properties in the OOU are informed of the appropriate construction specifications and

need for consultation with EPA when making inquiries with the City of Sunnyvale.

Upon EPA approval, Respondents shall either conduct PRSC activities, or obtain a written commitment from a different entity for conduct of such activities, until such time as EPA determines that no further PRSC is necessary. Respondents shall provide EPA with documentation of all PRSC commitments from a different entity.

G. Final Removal Action Report

Respondents shall prepare and submit to EPA for approval a Final Removal Action Report, which summarizes the Work conducted pursuant to this SOW. This report should present in both tabular and graphical form the data collected during the performance of the Work, in a manner which preserves personally identifiable information.

IV. Implementation

Respondent, Philips, has conducted significant portions of the Work described in this SOW in the OOU pursuant to the now-terminated 2015 AOC, and Respondents shall resume the previously-initiated VI assessment and mitigation activities following the Effective Date of the Settlement and in accordance with this SOW. Moreover, Respondents shall implement all approved deliverables in accordance with the approved schedules.

V. Schedules

All deliverables and tasks required under this SOW must be submitted or completed by the deadlines or within the time durations listed in the Schedules set forth below. Respondents may submit proposed revised Schedules for EPA approval. Upon EPA's approval, the revised Schedules supersede the Schedules set forth below, and any previously-approved Schedules.

DELIVERABLE	DUE DATE (calendar days)
Participation in and Presentation at Technical Meetings	Upon request by EPA
Participation in and Content Development for Community Involvement Activities	Upon request by EPA
Designation of Community Involvement Coordinator	Within fifteen (15) days following a request by EPA

Written notice of off-Site waste shipments	Prior to shipping waste material from the Site in excess of ten (10) cubic yards to an off-Site waste management facility
Scoping Meeting	Upon mutually-agreed upon date between EPA and Respondents after the Effective Date
Updated Removal Work Plan	Within forty-five (45) days after the Effective Date
Health and Safety Plan	Within forty-five (45) days after the Effective Date
Updated Sampling and Analysis Plan - Updated Field Sampling Plan - Updated Quality Assurance Project Plan	Within sixty (60) days after the Effective Date
Progress Reports	Beginning seven (7) days after EPA's approval of the Updated Removal Work Plan and monthly thereafter, submitted to EPA by the tenth (10^{th}) day of the following month
CSM TM	Within forty-five (45) after EPA's approval of Updated Removal Work Plan
Updated Removal Work Plan Implementation - Resumption of previously-initiated Removal activities under the 2015 AOC - Preemptive Mitigation Plan Implementation	Commencement within twenty-one (21) days after EPA's approval of the CSM TM
Building-Specific VI Sampling Plan Addenda including: - Building Occupancy Summary - Ventilation Assessment - Chemical Inventory - Building Activities Summary Report - Proposed Sampling Locations - Building-Specific CSMs	As access is granted by property owners, within thirty (30) days after completion of building-specific Removal Work Plan Implementation, or, on a case-by-case basis, following a sampling event, upon approval by EPA
Building-Specific Indoor Air Sample Collection Implementation	Commencement within twenty-one (21) days after EPA's approval of each Building-Specific VI Sampling Plan Addendum, or later as arranged with property owners and tenants, subject to approval by EPA (For many residences, the initial indoor air sample collection may be performed in conjunction with the building survey)
Immediate or Short-Term Mitigation or Other Interim Response Activities, as appropriate	In accordance with the schedule in the Updated Removal Work Plan or applicable Building-Specific VI Sampling Plan Addendum, or as otherwise approved by EPA

Reports on Building-Specific Evaluation of Indoor Air and Mitigation Measures including: - Data evaluation - Any immediate/short-term measures previously conducted - Recommendation of next steps - Monitoring plans - Plans for PRSC	Within forty-five (45) after EPA's approval of completion of each Building-Specific Indoor Air Sample Collection effort or completion of immediate or short-term mitigation response measures (see Section III(E))
Implementation of initial or additional Building-Specific Risk Management and Mitigation Measures, Monitoring Plans, and PRSCs	Commencement within thirty (30) days after EPA's approval of Building-Specific Report on Evaluation of Indoor Air and Planned Mitigation Measures
Building-Specific Mitigation Completion Reports for each building including: - Operation & Maintenance Plans - City Building/Safety Permits - Occupant Information Sheets - As-Built Drawings - Other Necessary Post-Removal Site Control Measures	Within forty-five (45) days after EPA's approval of completion of Building-Specific Risk Management and Mitigation Measures, Monitoring Plans, and Institutional Controls
Final Removal Action Report	Within sixty (60) days after EPA's approval of all Building-Specific Mitigation Completion Reports and EPA's approval of completion of field Removal Action activities

VI. References and Guidance Documents

The following list, although not comprehensive, consists of many of the regulations and guidance documents that apply to the Work. Respondents shall review these documents (latest edition/revision) and shall use the information provided therein in performing the Work.

1. American National Standards Practices for Respiratory Protection. American National Standards Institute Z88.2-1980, March 11, 1981.
2. ARCS Construction Contract Modification Procedures, September 1989, OERR Directive 9355.5-01/FS.
3. CERCLA Compliance with Other Laws Manual, Two Volumes, U.S. EPA, Office of Emergency and Remedial Response, August 1988 (DRAFT), OSWER Directive No. 9234.1-01 and -02.
4. Community Relations in Superfund - A Handbook, U.S. EPA, Office of Emergency and Remedial Response, January 1992, OSWER Directive No. 9230.0-3C.

5. A Compendium of Superfund Field Operations Methods, Two Volumes, U.S. EPA, Office of Emergency and Remedial Response, EPA/540/P-87/001a, August 1987, OSWER Directive No. 9355.0-14.
6. Construction Quality Assurance for Hazardous Waste Land Disposal Facilities, U.S. EPA, Office of Solid Waste and Emergency Response, October 1986, OSWER Directive No. 9472.003.
7. Contractor Requirements for the Control and Security of RCRA Confidential Business Information, March 1984.
8. Data Quality Objectives for Remedial Response Activities, U.S. EPA, Office of Emergency and Remedial Response and Office of Waste Programs Enforcement, EPA/540/G-87/003, March 1987, OSWER Directive No. 9335.0-7B.
9. Engineering Support Branch Standard Operating Procedures and Quality Assurance Manual, U.S. EPA Region IV, Environmental Services Division, April 1, 1986 (revised periodically).
10. EPA NEIC Policies and Procedures Manual, EPA-330/9-78-001-R, May 1978, revised November 1984.
11. Federal Acquisition Regulation, Washington, DC: U.S. Government Printing Office (revised periodically).
12. Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, Interim Final, U.S. EPA, Office of Emergency and Remedial Response, October 1988, OSWER Directive NO. 9355.3-01.
13. Guidance on EPA Oversight of Remedial Designs and Remedial Actions Performed by Potential Responsible Parties, U.S. EPA Office of Emergency and Remedial Response, EPA/540/G-90/001, April 1990.
14. Guidance on Expediting Remedial Design and Remedial Actions, EPA/540/G-90/006, August 1990.
15. Guidance on Remedial Actions for Contaminated Ground Water at Superfund Sites, U.S. EPA Office of Emergency and Remedial Response (DRAFT), OSWER Directive No. 9283.1-2.
16. Guide for Conducting Treatability Studies Under CERCLA, U.S. EPA, Office of Emergency and Remedial Response, Prepublication version.
17. Guide to Management of Investigation-Derived Wastes, U.S. EPA, Office of Solid Waste and Emergency Response, Publication 9345.3-03FS, January 1992.
18. Guidelines and Specifications for Preparing Quality Assurance Project Plans, U.S. EPA, Office of Research and Development, Cincinnati, OH, QAMS-004/80, December 29, 1980.
19. Health and Safety Requirements of Employees Employed in Field Activities, U.S. EPA, Office of Emergency and Remedial Response, July 12, 1982, EPA Order No. 1440.2.
20. Interim Guidance on Compliance with Applicable of Relevant and Appropriate Requirements, U.S. EPA, Office of Emergency and Remedial Response, July 9, 1987, OSWER Directive No. 9234.0-05.
21. Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans, U.S. EPA, Office of Emergency and Remedial Response, QAMS-005/80, December 1980.
22. Methods for Evaluating the Attainment of Cleanup Standards: Vol. 1, Soils and Solid Media, February 1989, EPA 23/02-89-042; vol. 2, Ground Water (Jul 1992).
23. National Oil and Hazardous Substances Pollution Contingency Plan; Final Rule, Federal Register 40 CFR Part 300, March 8, 1990.

24. NIOSH Manual of Analytical Methods, 2nd edition. Volumes I-VII for the 3rd edition, Volumes I and II, National Institute of Occupational Safety and Health.
25. Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, National Institute of Occupational Safety and Health/Occupational Health and Safety Administration/United States Coast Guard/Environmental Protection Agency, October 1985.
26. Permits and Permit Equivalency Processes for CERCLA On-Site Response Actions, February 19, 1992, OSWER Directive 9355.7-03.
27. Procedure for Planning and Implementing Off-Site Response Actions, Federal Register, Volume 50, Number 214, November 1985, pages 45933-45937.
28. Procedures for Completion and Deletion of NPL Sites, U.S. EPA, Office of Emergency and Remedial Response, April 1989, OSWER Directive No. 9320.2-3A.
29. Quality in the Constructed Project: A Guideline for Owners, Designers and Constructors, Volume 1, Preliminary Edition for Trial Use and Comment, American Society of Civil Engineers, May 1988.
30. Remedial Design and Remedial Action Handbook, U.S. EPA, Office of Emergency and Remedial Response, June 1995, OSWER Directive No. 9355.5-22.
31. Revision of Policy Regarding Superfund Project Assignments, OSWER Directive No. 9242.3-08, December 10, 1991. [Guidance, p. 2-2]
32. Scoping the Remedial Design (Fact Sheet), February 1995, OSWER Publ. 9355-5-21 FS.
33. Standard Operating Safety Guides, U.S. EPA, Office of Emergency and Remedial Response, November 1984.
34. Standards for the Construction Industry, Code of Federal Regulations, Title 29, Part 1926, Occupational Health and Safety Administration.
35. Standards for General Industry, Code of Federal Regulations, Title 29, Part 1910, Occupational Health and Safety Administration.
36. Structure and Components of 5-Year Reviews, OSWER Directive No. 9355.7-02, May 23, 1991. [Guidance, p. 3-5]
37. Superfund Guidance on EPA Oversight of Remedial Designs and Remedial Actions Performed by Potentially Responsible Parties, April 1990, EPA/540/G-90/001.
38. Superfund Remedial Design and Remedial Action Guidance, U.S. EPA, Office of Emergency and Remedial Response, June 1986, OSWER Directive No. 9355.0-4A.
39. Superfund Response Action Contracts (Fact Sheet), May 1993, OSWER Publ. 9242.2-08FS.
40. TLVs-Threshold Limit Values and Biological Exposure Indices for 1987-88, American Conference of Governmental Industrial Hygienists.
41. Treatability Studies Under CERCLA, Final. U.S. EPA, Office of Solid Waste and Emergency Response, EPA/540/R-92/071a, October 1992.
42. USEPA Contract Laboratory Program Statement of Work for Inorganic Analysis, U.S. EPA, Office of Emergency and Remedial Response, July 1988.
43. USEPA Contract Laboratory Program Statement of Work for Organic Analysis, U.S. EPA, Office of Emergency and Remedial Response, February 1988.
44. User's Guide to the EPA Contract Laboratory Program, U.S. EPA, Sample Management Office, August 1982.
45. Value Engineering (Fact Sheet), U.S. EPA, Office of Solid Waste and Emergency Response, Publication 9355.5-03FS, May 1990.
46. Risk Assessment Guidance for Superfund Volume 1: Human Health Evaluation Manual (Part B, Development of Risk-Based Preliminary Remediation Goals), U.S. EPA, Office of

Solid Waste and Emergency Response, Directive 9285.7-01B, NTIS PB92-963333, December 13, 1991.
47. Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors, U.S. EPA, Office of Solid Waste and Emergency Response, Directive 9200.1-120, Feb. 6, 2014. http://www.epa.gov/oswer/riskassessment/pdf/superfund-hh-exposure/OSWER-Directive-9200-1-120-ExposureFactors.pdf
48. Role of Background in the CERCLA Cleanup Program, Directive 9285.6-07P, U.S. EPA, 2002. http://www.epa.gov/oswer/riskassessment/pdf/role.pdf
49. OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air, U.S. EPA, June 2015, OSWER Publication 9200.2-154.
50. Engineering Issue: Indoor Air Vapor Intrusion Mitigation Approaches, EPA, 2008. Publication No. EPA/600/R-08/115
51. Final Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air, DTSC, October 2011 http://www.dtsc.ca.gov/AssessingRisk/upload/Final_VIG_Oct_2011.pdf
52. Vapor Intrusion Mitigation Advisory, Final, Revision 1, DTSC, October 2011 https://dtsc.ca.gov/SiteCleanup/upload/VIMA_Final_Oct_20111.pdf
53. Vapor Intrusion Pathway: A Practical Guideline, Interstate Technology & Regulatory Council, January 2007 http://www.itrcweb.org/Documents/VI-1.pdf
54. Building Air Quality (BAQ) A Guide for Building Owners and Facility Managers, December 1991 at http://www.epa.gov/iaq/largebldgs/baqtoc.html
55. USEPA Best Practices for Environmental Site Management: A Practical Guide for Applying Environmental Sequence Stratigraphy to Improve Conceptual Site Models, EPA/600/R-17/293, September 2017.
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58. Interim Final Risk Assessment Guidance for Superfund, Volume I - Human Health Evaluation Manual (Part D, Standardized Planning, Reporting, and Review of Superfund Risk Assessments), RAGS, EPA-540-R-97-033, OSWER Directive 9285.7-01D, January 1998.
59. Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments, ERAGS, EPA-540-R-97-006, OSWER Directive 9285.7-25, June 1997.
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68. Institutional Controls: A Guide to Planning, Implementing, Maintaining, and Enforcing Institutional Controls at Contaminated Sites, OSWER Directive 9355.0-89, November 2010.
69. USEPA Region 9. Letter to Stephen Hill, Chief, Toxics Cleanup Division, California Regional Water Quality Control Board – SF Bay Region. EPA Region 9 Guidelines and Supplemental Information Needed for Vapor Intrusion Evaluations at the South Bay National Priorities List (NPL) Sites. December 3, 2013.